

Finance And Risk Analytics : Capstone Project

Submitted By:
Preetam Kumar Singh
Sushant Padole
Navneet Kumar

Agenda

- Objective
- Insights & Visualization
- Sector-Wise Analysis
- Key Findings
- Portfolio Analysis
- Methodology

Objective

We are analyzing past data of stocks from different sectors and provide with the investment guidance based on the needs of two clients.

Mr. Patrick Jyengar

- Mr. Patrick Jyengar wants to invest \$500k in stocks.
- He is conservative investor and prefers low risk investment.
- His goal is to double his capital in 5 years time.

Mr. Peter Jyengar

- Mr. Peter Jyengar wants to invest \$1million in equities.
- He is a high-risk investor and prefers high return investment.
- His goal is to double his capital in 5 years time.



Insights & Visualization

Stocks Data Overview

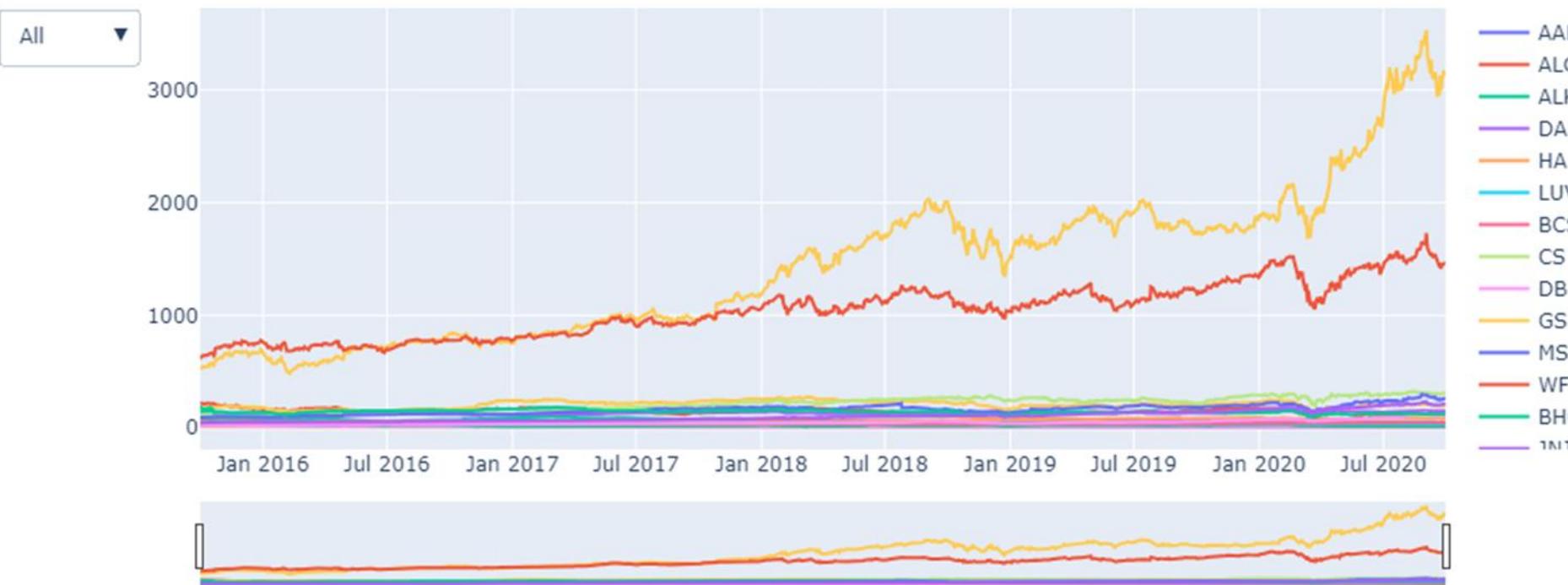
- We have 24 stocks categorized into 4 sectors.
- Each sector comprises 6 stocks.
- The sectors are: Aviation, Finance, Pharma&Healthcare and Technology.
- We also have S&P500 index, which represents the top 500 stocks in the US stock market.
- This is the list of stocks with their abbreviations, Industry and Company Name.

Ticker	Industry	Company Name
AAL	Aviation	American Airlines Group Inc
ALGT	Aviation	Allegiant Travel Company
ALK	Aviation	Alaska Air Group Inc
DAL	Aviation	Delta Air Lines Inc
HA	Aviation	Hawaiian Holdings Inc
LUV	Aviation	Southwest Airlines Co
BCS	Finance	Barclays
CS	Finance	Credit Suisse
DB	Finance	Deutsche Bank
GS	Finance	Goldman Sachs
MS	Finance	Morgan Stanley
WFC	Finance	Wells Fargo
JNJ	Healthcare	Johnson & Johnson
MRK	Healthcare	Merck and CO inc.
PFE	Healthcare	Pfizer inc
UNH	Healthcare	UnitedHealthGroup Inc
BHC	Pharmaceuticals	Bausch Health Companies inc
RHHBY	Pharmaceuticals	Roche Holding AG
AAPL	Technology	Apple Inc
AMZN	Technology	Amazon
FB	Technology	Facebook
GOOG	Technology	Alphabet
IBM	Technology	IBM
MSFT	Technology	Microsoft

Visualization

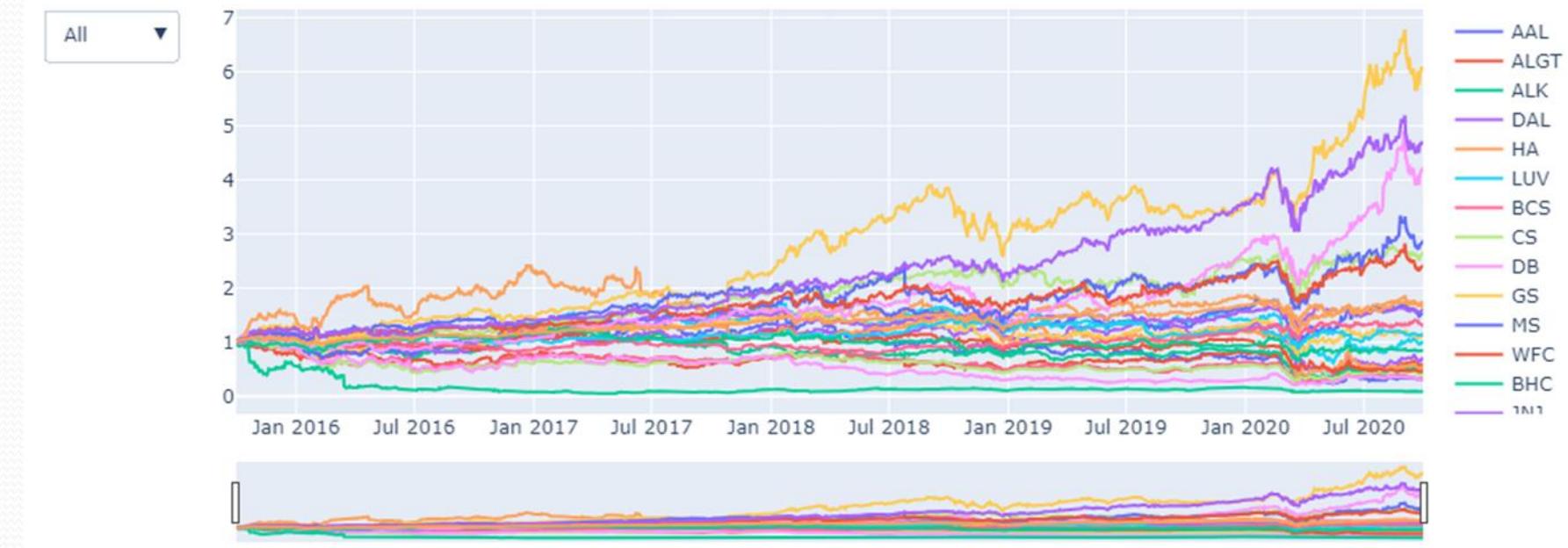
Actual Stock Values

Visualising Actual Stock Values



Normalized Stock Values

Visualising Normalized Stock Values



- The plot above shows the performance of all the stocks in last 5 years.
- It clearly shows that Amazon, Microsoft and Google are best performing over the last 5 years as comparison with other stocks.

- The above graph shows the performance of all the stocks as compared with S&P500 index.
- It clearly shows that there are 8 stocks having returns of greater than 80% at the end of 5 years.

Sector-Wise Analysis

Aviation Sector

- The Aviation Sector was severely hit in March 2020 due to COVID-19 pandemic.
- It hasn't recovered back since then.
- Even though the Market Index has gone up, this sector continues to face challenges.



Finance Sector

- Finance sector has also faced a major crisis due to COVID-19 pandemic in March 2020.
- But the sector has recovered a bit although majority of stocks has been hit.
- **Morgan Stanley & Goldman Sachs** have performed well as compared to other stocks.

Visualising Normalized Stock Values



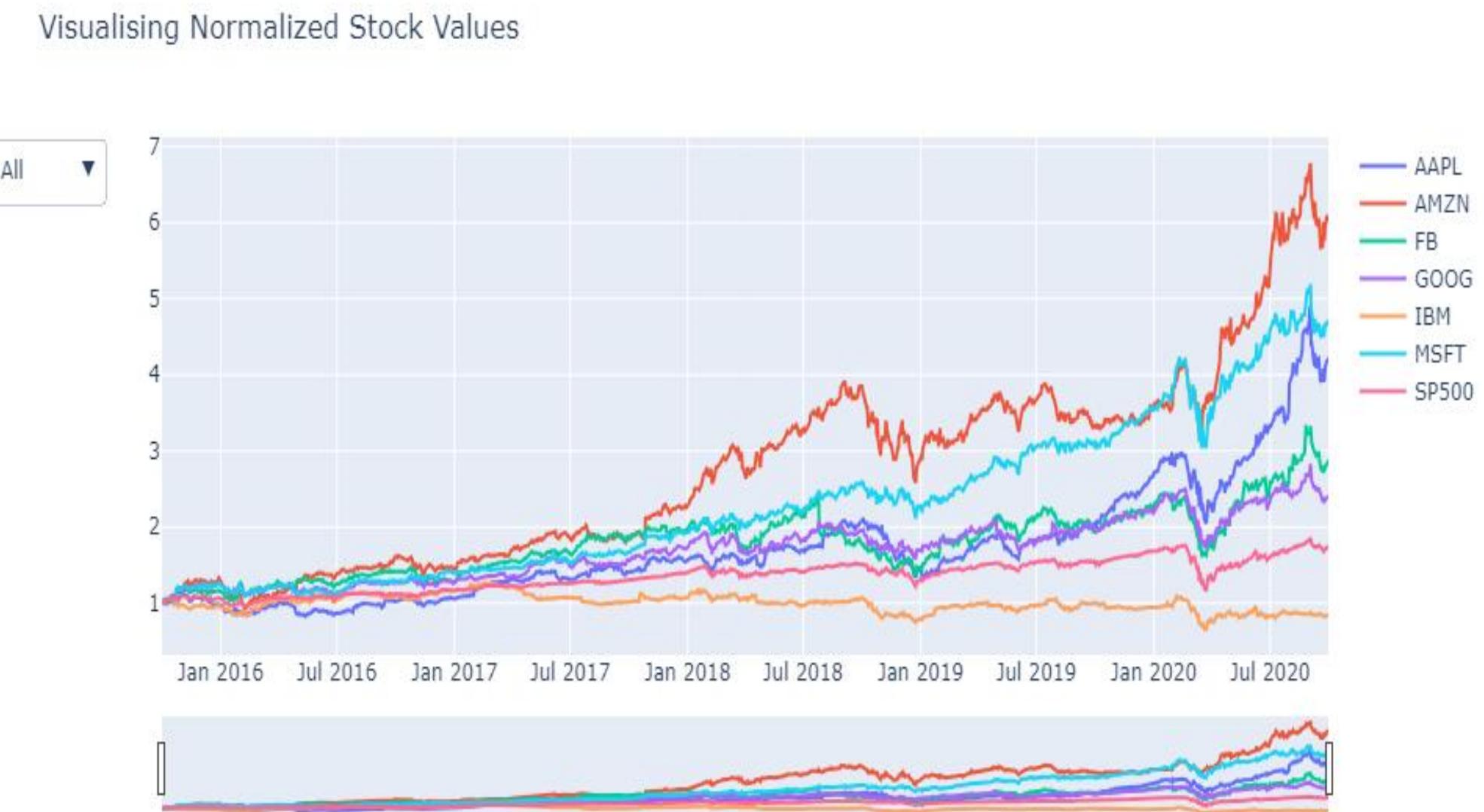
Pharma & Health Care Sector

- Pharma & Health care sector has also faced a major crisis in March 2020 due to COVID-19 pandemic. But this sector has shown an impressive recovery.
- **United Health, Johnson & Johnson** have performed well when compared to S&P Index.
- **Bausch Health** is consistently performed very badly over the years when compared to other stocks in the same sector.



Technology Sector

- Technology Sector has also faced crisis due to COVID-19 pandemic in March 2020, but the recovery rate shown by this sector is impressive.
- **Microsoft, Amazon, Apple, Facebook & Google** have performed well along with Market index.
- **IBM** has consistently underperformed over the years when compared to other stocks in the same sector.



Key Findings

Stocks with Return more than 80% after 5 Years

Annual Returns of Selected Stocks:

- AMZN: 40.59%

- MSFT: 34.95%

- AAPL: 33.32%

- FB: 26.45%

- UNH: 23.72%

- GOOG: 21.02%

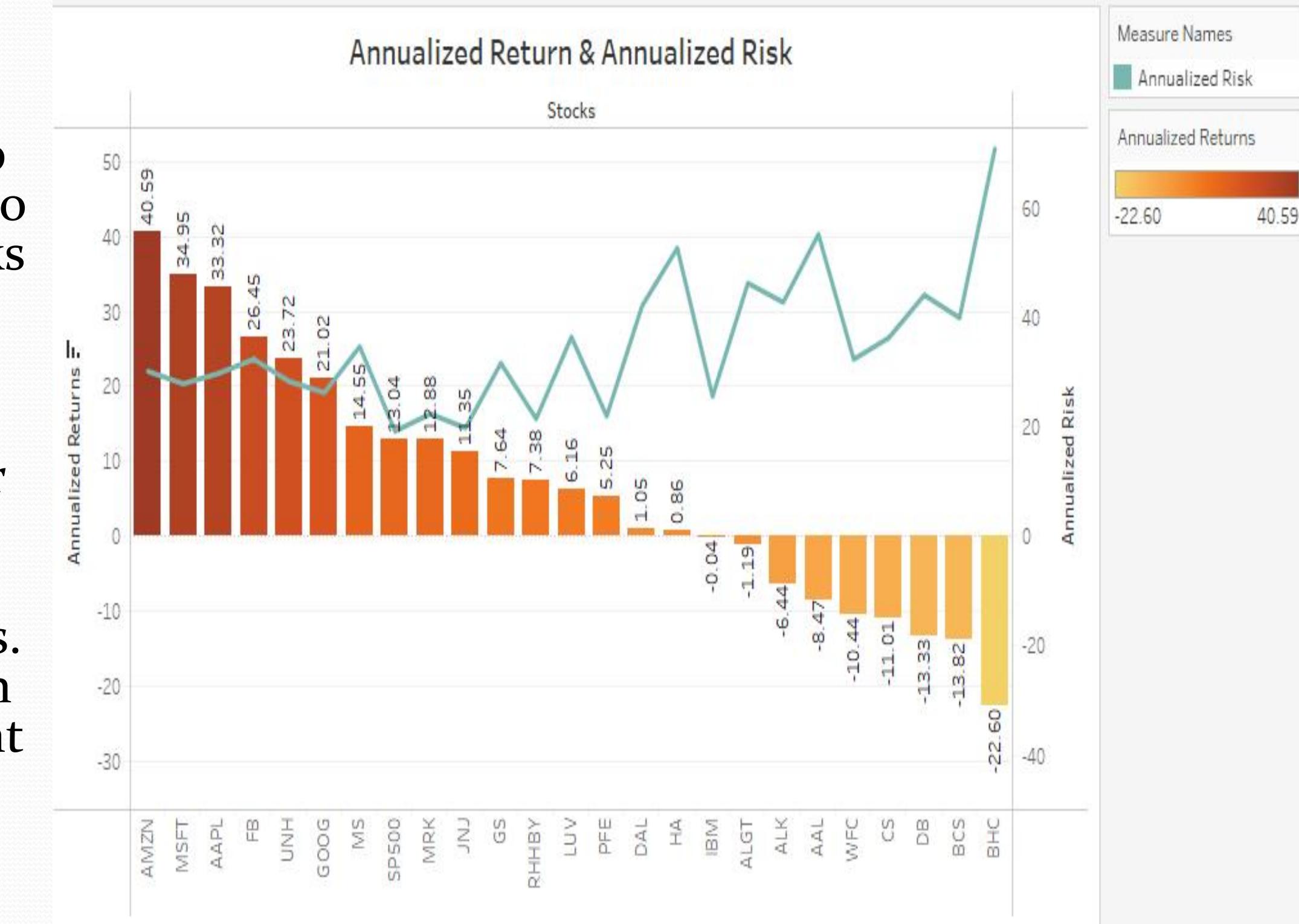
- MS: 14.55%

- S&P500: 13.04%

Stock	Avg Daily Returns	Risk	Min	Max	Annualized_Retruns	Annualized_Risk	Sharpe_Ratio	Cumulative Returns
AMZN	0.16	1.9	-7.92	13.22	40.59	30.11	1.32	504.69
MSFT	0.14	1.75	-14.74	14.22	34.95	27.84	1.23	371.49
AAPL	0.13	1.87	-12.86	11.98	33.32	29.73	1.1	322.74
FB	0.1	2.04	-18.96	15.52	26.45	32.31	0.8	187.96
UNH	0.09	1.78	-17.28	12.8	23.72	28.27	0.81	167.36
GOOG	0.08	1.65	-11.1	10.45	21.02	26.23	0.77	140.41
MS	0.06	2.18	-15.6	19.77	14.55	34.62	0.4	53.49
S&P500	0.05	1.21	-11.98	9.38	13.04	19.18	0.64	74.81
MRK	0.05	1.41	-8.9	10.41	12.88	22.33	0.54	68.02
JNJ	0.05	1.25	-10.04	8	11.35	19.78	0.54	59.79
GS	0.03	1.99	-12.71	17.58	7.64	31.59	0.22	14.17
RHHBY	0.03	1.35	-8.96	13.01	7.38	21.45	0.31	28.87
LUV	0.02	2.29	-15.11	14.44	6.16	36.37	0.15	-2.37
PFE	0.02	1.38	-7.73	8.96	5.25	21.95	0.21	15.26
DAL	0	2.65	-25.99	21.02	1.05	42.03	0.01	-32.66
HA	0	3.31	-26.5	24.58	0.86	52.6	0	-47.88
IBM	0	1.61	-12.85	11.3	-0.04	25.54	-0.03	-15.27
ALGT	0	2.91	-28.33	29.24	-1.19	46.2	-0.04	-45.04
Alk	-0.03	2.69	-23.24	20.31	-6.44	42.71	-0.17	-54.34
AAL	-0.03	3.47	-25.22	41.1	-8.47	55.12	-0.17	-68.65
WFC	-0.04	2.03	-15.87	14.53	-10.44	32.3	-0.35	-54.3
CS	-0.04	2.28	-18.26	16.34	-11.01	36.26	-0.32	-58.61
DB	-0.05	2.77	-17.49	14.02	-13.33	44.04	-0.32	-68.33
BCS	-0.05	2.51	-21.85	15.1	-13.82	39.87	-0.37	-66.62
BHC	-0.09	4.46	-51.46	33.74	-22.6	70.72	-0.33	-91.35

Annualized Returns & Risk

- The top five stocks by annualized return are **AMZN, MSFT, AAPL, FB, and UNH**.
- The annualized return on each of the top 5 stocks is greater than 20%. Compared to other equities, the risk of these five stocks is moderate.
- Lower returns increase the likelihood of losing the initial investment.
- BHC, BCS, DB, CS, and WFC** have higher risk as they didn't provide returns on the initial investment.
- Lower ROI indicates higher risk in stocks. However, some stocks may not offer high returns but provide a risk-free investment opportunity.
- JNJ, RHHBY, MRK** are stocks with less risk and good returns.



Portfolio Analysis

Patric Jyengar Portfolio

- **Investment Goal:** Double the investment in 5 years with decent returns and low risk.
- **Preferred Stocks:** JNJ, RHHBY, MRK are suitable due to their low risk.
- However, these three stocks wouldn't alone reach the desired returns.
- A portion of the investment can be allocated to MSFT to achieve the target returns.
- **Equal weightage of 0.25** is allocated to all stocks.
- Investment: **\$500 K** in equities.
- **Expected Returns: \$1.05 Million** after 5 years.
- **Gain on Investment: \$558.23 K.**



Peter Jyengar Portfolio

- **Investment Goal:** High-return investments for inorganic expansion of the company, accepting high risk.
- **Preferred Stock:** AMZN , due to its high-risk/high-return nature.
- Believes in bouncing back from occasional losses.
- **Investment:** \$ 1 Million from company's cash and cash equivalents.
- **Expected Returns:** More than \$6 Million after 5 years.
- **Gain on Investment:** More than \$5 Million.
- Focus on maximum returns and managing associated risk.



Methodology

Methodology

Exploratory Data Analysis:

- Checked for the Null Values in the dataset. No column has the Null Values.
- Checked for the Outliers in the dataset.

Data Analysis:

- Calculated Daily Returns, Cumulative Returns, Sharpe Ratio, Portfolio Risk, and Return On Investment(ROI).
- Identified the top-performing stocks.
- Discovered 8 to 9 stocks with over 80% returns in the last 5 years.

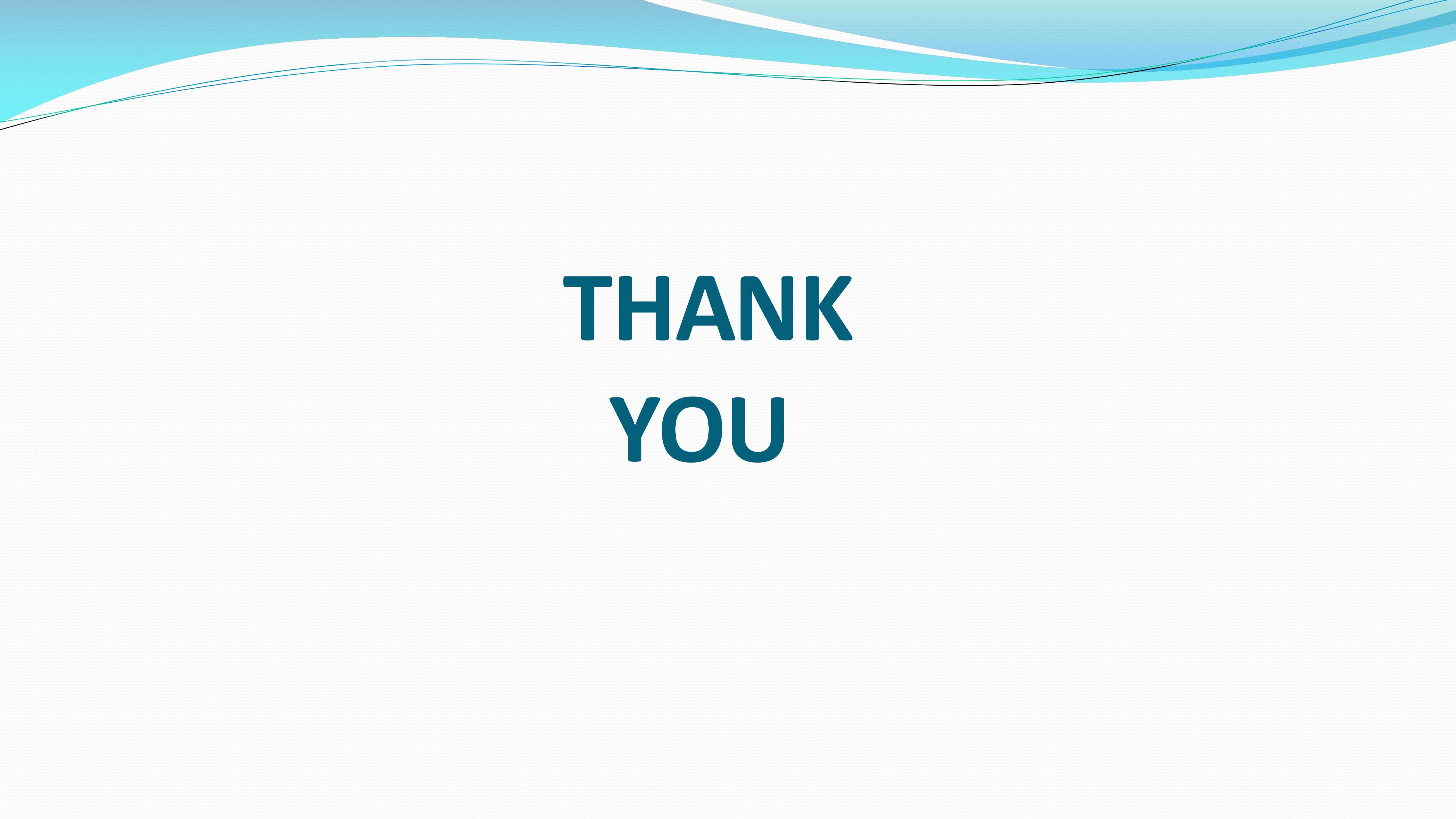
Top Performing Stocks:

- AAPL, AMZN, FB, GOOG, MSFT, UNH, RHHBY, MS are the Top-Performing Stocks.
- Performed sector-wise analysis to get a better view of each sector.

Risk & Returns:

- Each Stock has different levels of risk and liability.
- AMZN offers high returns but has high risk.
- JNJ, RHHBY, MRK, and MSFT offer good returns with lower risk.

After doing all the analysis, we have finalized the Portfolios for both the customers.



**THANK
YOU**